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TESTS OF EFFICIENCY IN THE RURAL AND VILLAGE SCHOOLS OF SANTA CLARA COUNTY, CALIFORNIA[1]

RICHARD ZEIDLER
Palo Alto, California

The object of this study was to measure the results of arithmetic teaching in the rural and village schools of Santa Clara County, and to ascertain the status of such schools in the teaching of the fundamentals in arithmetic as compared with the work in localities where similar tests have been made. It is to be regretted, however, that the results cannot be compared with those in other rural and village schools. Thus far tests have been made only in cities. The comparison can therefore be made only with cities.

The tests used cover the four fundamental operations in arithmetic, viz.: addition, subtraction, multiplication, and division; and their application shows the children's ability in speed and accuracy. These tests are known as the Courtis Standard Tests.[2]

HOW THE TESTS WERE CONDUCTED

The following instructions, followed by typical examples, illustrate the nature of the tests.

You will be given eight minutes to find the answers to as many of these addition examples as possible. Write the answer on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

927	297	136	486	384	176	277	837
379	925	340	765	477	783	445	882
756	473	988	524	881	697	682	959
837	983	386	140	266	200	594	603
924	315	353	812	679	366	481	118
110	661	904	466	241	851	778	781
854	794	547	355	796	535	849	756
965	177	192	834	850	323	157	222
344	124	439	567	733	229	953	525

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[1] This study was made in connection with a course in rural education at Leland Stanford Junior University, given by Professor J. B. Sears, and was presented as a class report.

[2] S. A. Courtis, *Standard Tests.* 82 Eliot Street, Detroit, Michigan.

You will be given four minutes to find the answers to as many of these substraction examples as possible. Write the answers on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

$$\begin{array}{r}115364741\\80195261\\\hline\end{array}\qquad\begin{array}{r}67298125\\29346861\\\hline\end{array}\qquad\begin{array}{r}92057352\\42689037\\\hline\end{array}\qquad\begin{array}{r}113380936\\42556840\\\hline\end{array}$$

You will be given six minutes to work as many of these multiplication examples as possible. You are not expected to be able to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

$$\begin{array}{r}8236\\29\\\hline\end{array}\qquad\begin{array}{r}3597\\73\\\hline\end{array}\qquad\begin{array}{r}5739\\85\\\hline\end{array}\qquad\begin{array}{r}2648\\46\\\hline\end{array}\qquad\begin{array}{r}9537\\92\\\hline\end{array}$$

You will be given eight minutes to work as many of these division examples as possible. You are not expected to be able to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

25)6775 94)85352 37)9990 86)80066 73)58765

There were more examples in each of the four sets than the child would be likely to work in the time allowed. The examples were all printed in a folder, and the necessary oral explanations were given by the examiner who timed the pupils and scored the results. Where possible, the pupils were all tested during the same time in each school. The teacher, and the children in the first four grades, left the room, and all occasion for distracting the attention of the children was removed, as far as possible.

THE RESULTS OF THE TESTS

The tables and diagrams given on the pages which follow show the results of the tests.

Table I shows the distribution of children with respect to the number of examples finished. It also shows the full distribution of scores, by grades, for the four subjects, and the median score attained in each case. It will be seen that a wide range of ability characterizes the work in each grade, that all the grades obtain their highest scores in subtraction, and that a very marked falling off in division is shown by the fifth and sixth grades. It will be seen that practically 50 per cent of the children in the fifth grade fail completely in division, and 32 per cent of the sixth grade do the same.

TABLE I

ADDITION (TIME 8 MINUTES)

Grade	Total Papers	Number of Examples Worked																									Median Score
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	7	8	17	14	21	16	17	8	9	6	4	4	2	1	3	2	..	..	1	..	..	..	..	..	..	4·3
VII..	161	12	18	19	19	24	12	23	11	9	3	3	3	4	1	..	..	..	..	..	..	..	..	..	..	..	3·5
VI...	134	12	24	27	24	15	11	5	7	7	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2.3
V....	152	31	27	23	22	23	10	7	1	2	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.8

SUBTRACTION (TIME 4 MINUTES)

Grade	Total Papers	Number of Examples Worked																									Median Score
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	1	2	4	8	9	16	16	16	11	14	12	8	8	8	3	3	1	..	..	..	1	..	..	..	..	6.8
VII..	161	2	4	9	24	9	28	16	17	13	10	17	4	5	1	..	1	..	..	1	..	..	..	1	..	..	5·2
VI...	134	11	13	14	21	18	18	9	13	3	8	3	2	..	..	1	..	..	..	..	..	..	..	..	..	..	3·5
V....	152	20	16	18	25	20	14	15	9	8	1	5	2	1	..	..	..	..	..	..	..	..	..	..	..	..	2.8

MULTIPLICATION (TIME 6 MINUTES)

Grade	Total Papers	Number of Examples Worked																									Median Score
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	4	7	8	10	16	17	16	16	9	7	8	5	3	1	1	1	..	..	..	..	..	..	..	..	..	4·9
VII..	161	7	17	26	22	21	19	17	7	8	7	6	4	1	..	..	..	..	..	..	..	..	..	..	..	..	3·4
VI...	134	16	23	20	20	25	19	4	6	..	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	2·5
V....	152	50	29	17	20	13	17	7	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.25

DIVISION (TIME 8 MINUTES)

Grade	Total Papers	Number of Examples Worked																									Median Score
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	7	8	7	18	22	13	13	15	6	6	6	5	6	3	2	1	1	..	..	..	..	..	..	..	..	4·5
VII..	161	13	15	21	27	22	8	21	11	9	7	3	2	1	..	..	2	..	..	..	..	..	..	..	..	..	3·2
VI...	134	43	21	24	19	12	3	6	2	1	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6
V ...	152	75	24	19	14	11	6	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·5

From the test, the median child may be expected to work examples at the following rates (using eight minutes each for addition and division, four minutes for subtraction, and six minutes for multiplication): In the fifth grade he can add 1.8 examples, subtract 2.8, multiply 1.25, and divide 0.5. In the sixth grade he can add 2.3 examples, subtract 3.5, multiply 2.5, and divide 1.6. In the seventh grade he can add 3.5 examples, subtract 5.2, multiply 3.4, and divide 3.2. In the eighth grade he can add 4.3 examples, subtract 6.8, multiply 4.9, and divide 4.5.

SANTA CLARA COUNTY COMPARED WITH A GROUP OF SMALL CITIES, AND WITH TWO WESTERN CITIES

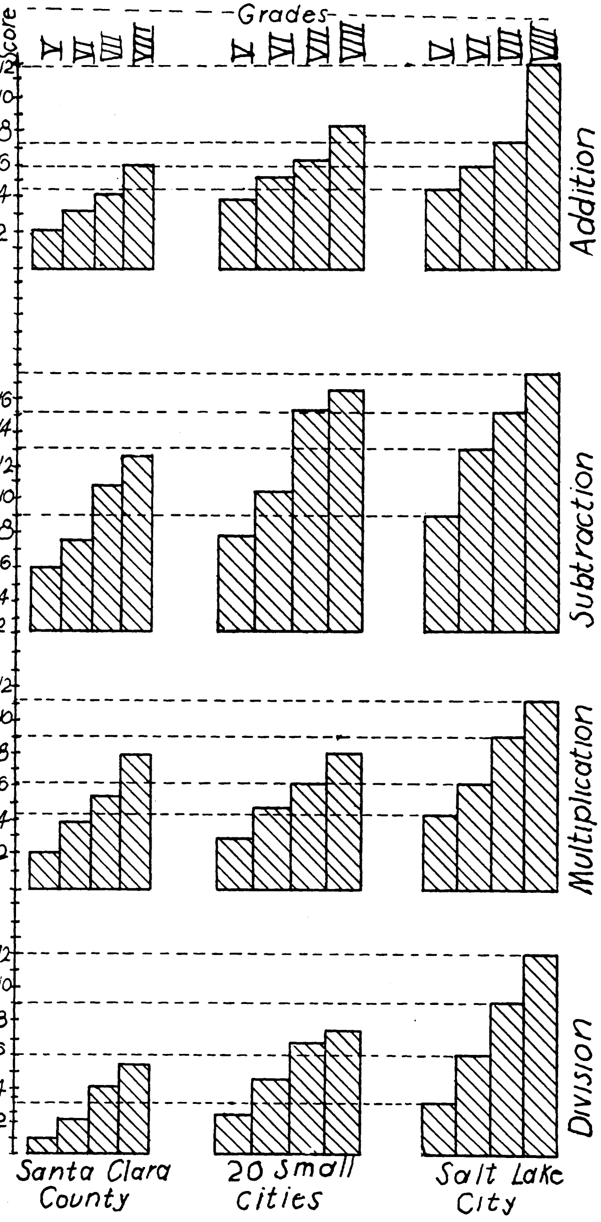
Table II shows the full details of the standing of the rural and village schools of Santa Clara County in the fundamentals of arithmetic as compared with a group of twenty small cities in the Middle West, and with two western cities.

TABLE II

THE STANDING OF THE RURAL AND VILLAGE SCHOOLS OF SANTA CLARA COUNTY IN THE FUNDAMENTALS OF ARITHMETIC AS COMPARED WITH A GROUP OF TWENTY SMALL CITIES AND TWO WESTERN CITIES

Addition					Multiplication			
V	VI	VII	VIII		V	VI	VII	VIII
4.1	6.4	6.9	8.5	......Salt Lake City, Utah......	3.8	4.8	6.0	7.5
2.9	3.4	3.8	5.3	........Butte, Montana........	4.1	5.0	6.5	8.1
3.9	4.4	4.7	5.6	......Group of Small Cities......	2.6	4.5	5.2	6.4
1.8	2.3	3.5	4.3	......Santa Clara County......	1.25	2.5	3.4	4.9
Subtraction					Division			
5.2	7.8	8.8	9.8	......Salt Lake City, Utah......	3.0	5.5	7.7	9.5
2.9	3.4	3.8	5.3	........Butte, Montana........	3.6	4.3	7.2	10.2
4.5	6.1	7.8	8.4	......Group of Small Cities......	2.3	4.3	5.8	6.3
2.8	3.5	5.2	6.8	......Santa Clara County......	0.5	1.6	3.2	4.5

From these tables it will be noted that the rural and village schools in Santa Clara County, in every subject and in every grade, fall below the median scores for the cities. This inferiority ranges as high as 600 per cent, as is shown in division in the fifth grade of



Standing of the children of Santa Clara County in the fundamentals of arithmetic, judged by the median score attained in each grade.

Santa Clara County compared with fifth-grade division in Salt Lake City, Utah. It must be admitted, however, that Salt Lake City has an enviable record. Fig. 1 presents these data graphically and by following the dotted line across the page it will be seen that rural and village schools of Santa Clara County fall, on the average, fully two grades below Salt Lake City, and one grade below the twenty small cities. Why so vast a difference between rural and city schools?

TABLE III

ADDITION (TIME 8 MINUTES)

Grade	Total Papers	Number of Examples Attempted																									Median Attempts
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	..	..	..	..	5	3	11	13	20	22	18	10	11	5	3	2	4	3	3	1	..	..	..	1	1	8.8
VII..	161	1	..	..	3	5	17	25	13	34	23	15	6	5	5	3	3	3	..	..	..	..	..	..	..	..	7.5
VI...	134	..	..	3	5	13	21	25	15	23	9	9	6	1	1	1	..	..	..	..	..	..	..	..	..	..	6.1
V....	152	..	2	2	17	15	27	23	20	17	14	10	2	3	..	..	..	..	..	..	..	..	..	..	..	..	5.5

SUBTRACTION (TIME 4 MINUTES)

Grade	Total Papers	Number of Examples Attempted																									Median Attempts
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	..	..	..	1	1	6	7	11	12	19	17	14	19	10	6	3	2	3	3	..	1	2	..	..	..	9.8
VII..	161	..	..	..	..	3	12	13	26	23	18	17	23	11	3	6	..	..	2	1	2	1	..	..	..	1	7.5
VI...	134	..	..	2	7	6	10	34	20	21	10	9	6	4	2	..	1	..	..	..	1	..	..	..	..	..	6.4
V....	152	2	2	6	5	18	29	26	22	18	7	11	1	3	2	..	1	..	..	..	..	..	..	..	..	..	5.5

MULTIPLICATION (TIME 6 MINUTES)

Grade	Total Papers	Number of Examples Attempted																									Median Attempts
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	1	..	..	2	3	7	21	26	21	16	9	11	6	5	2	4	2	2	1	..	..	..	..	..	..	7.5
VII..	161	1	..	3	6	12	19	37	24	9	15	14	12	3	3	2	..	2	..	..	..	..	..	..	..	..	6.1
VI...	134	2	2	7	14	19	33	25	14	9	2	1	2	1	1	..	..	..	..	..	..	..	..	..	..	..	4.8
V....	152	4	11	15	24	25	25	26	14	6	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.9

TABLE III—*Continued*

DIVISION (TIME 8 MINUTES)

Grade	Total Papers	Number of Examples Attempted																									Median Attempts
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
VIII	140	..	2	3	3	11	15	17	17	22	10	10	6	8	7	1	4	1	1	..	..	..	..	..	..	..	7.1
VII..	161	..	..	5	15	24	33	22	14	16	7	13	4	2	2	..	2	2	..	..	..	..	..	..	..	..	5.9
VI...	134	5	5	12	23	30	24	12	4	8	3	2	2	..	2	1	..	..	..	..	..	..	..	..	..	..	3.8
V....	152	10	20	21	18	26	30	12	9	5	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3.3

THE MEASURE OF ACCURACY

The foregoing material has dealt only with examples correctly worked, and does not show how many were attempted or how accurate the work of the pupils really is. Table III shows the dis-

TABLE IV

SHOWING THE MEDIAN NUMBER OF EXAMPLES TRIED AND THE MEDIAN NUMBER CORRECTLY WORKED IN THE RURAL AND VILLAGE SCHOOLS OF SANTA CLARA COUNTY, AND THE PERCENTAGE OF EXAMPLES TRIED WHICH WERE CORRECTLY WORKED IN SANTA CLARA COUNTY AS COMPARED WITH SALT LAKE CITY AND TWENTY SMALL CITIES IN THE MIDDLE WEST

SUBJECT	GRADE	SANTA CLARA COUNTY MEDIAN		PERCENTAGE OF EXAMPLES CORRECTLY WORKED		
		Attempts	Rights	Santa Clara County	Salt Lake City	20 Small Cities
Addition........	VIII........	8.8	4.3	48.9	88.8	56.8
	VII........	7.5	3.5	46.7	75.8	60.5
	VI.........	6.1	2.3	37.5	81.0	59.4
	V..........	5.5	1.8	32.5	36.9	54.5
Subtraction.....	VIII........	9.8	6.8	69.4	83.1	68.5
	VII........	7.5	5.2	69.3	87.1	73.0
	VI.........	6.4	3.5	54.7	91.7	76.4
	V..........	5.5	2.8	50.9	69.3	79.5
Multiplication...	VIII........	7.5	4.9	65.3	76.8	61.9
	VII........	6.1	3.4	55.7	82.5	67.1
	VI.........	4.8	2.5	52.1	66.8	68.6
	V..........	3.9	1.25	32.1	65.1	71.5
Division........	VIII........	7.1	4.5	63.4	92.2	57.8
	VII........	5.9	3.2	54.2	88.5	84.2
	VI.........	3.8	1.6	42.1	82.1	78.8
	V..........	3.3	0.5	15.1	68.2	85.8

tribution of children with respect to the number of examples *attempted*. It also shows the full distribution of attempts by grades for the four subjects, and the median number of attempts in each case. By dividing the medians of this table by the medians in Table I, we obtain the percentage of examples correctly worked, as shown in Table IV. This is the percentage of accuracy. Table IV therefore shows the median number of examples correctly worked in the rural and village schools of Santa Clara County, and it also shows the percentage of examples tried which were correctly worked in Santa Clara County as compared with Salt Lake City, and with twenty small cities in the Middle West.

By looking more closely at Table IV it will also be noted that, generally speaking, where the attempts and the rights are the highest, the percentage of accuracy is also the highest. In other words, those children who surpassed in speed also surpassed in accuracy. Table V shows this fact more clearly than does Table IV. In this table Santa Clara County is compared with the Courtis standardized

TABLE V

SANTA CLARA COUNTY COMPARED WITH THE COURTIS STANDARD SCORES

SUBJECT	GRADE	COURTIS STANDARD			SANTA CLARA COUNTY		
		Attempts	Rights	Percentage of Accuracy	Attempts	Rights	Percentage of Accuracy
Addition	VIII	9.7	5.6	57.7	8.8	4.3	48.9
	VII	8.9	4.7	52.8	7.5	3.5	46.7
	VI	8.0	4.4	55.0	6.1	2.3	37.5
	V	7.1	3.9	54.9	5.5	1.8	32.5
Subtraction	VIII	11.7	8.4	71.8	9.8	6.8	69.4
	VII	10.2	7.8	76.4	7.5	5.2	69.3
	VI	8.9	6.1	67.5	6.4	3.5	54.7
	V	6.5	4.5	69.2	5.5	2.8	50.9
Multiplication	VIII	9.9	6.4	64.6	7.5	4.9	65.3
	VII	8.4	5.2	61.9	6.1	3.4	55.7
	VI	7.2	4.5	62.5	4.8	2.5	52.1
	V	6.0	2.6	43.3	3.9	1.25	32.1
Division	VIII	8.8	6.3	71.6	7.1	4.5	63.4
	VII	7.6	5.8	76.3	5.9	3.2	54.2
	VI	5.8	4.3	74.1	3.8	1.6	42.1
	V	4.5	2.3	51.1	3.3	0.5	15.1

TABLE VI

SHOWING THE DIFFERENCES IN RESULTS OBTAINED IN DIFFERENT GROUPS OF SCHOOLS

SUBJECT	GRADE	ONE-ROOM SCHOOLS			TWO-ROOM SCHOOLS			THREE-ROOM SCHOOLS			VILLAGE SCHOOLS OF FOUR OR MORE ROOMS		
		Median Attempts	Median Rights	Percentage of Accuracy	Median Attempts	Median Rights	Percentage of Accuracy	Median Attempts	Median Rights	Percentage of Accuracy	Median Attempts	Median Rights	Percentage of Accuracy
Addition...	VIII	8.4	3.2	38.1	9.7	5.0	51.5	8.0	4.5	55.0	8.1	4.4	54.3
	VII	7.0	3.4	48.6	7.8	3.8	48.7	8.0	6.0	75.0	7.2	9.2	40.2
	VI	5.4	1.5	27.8	6.5	2.7	41.5	4.9	2.7	55.1	7.0	2.1	30.0
	V	3.9	1.1	28.2	5.4	2.3	42.6	4.8	1.5	31.2	6.0	2.0	33.3
Subtraction	VIII	8.5	6.5	76.4	10.6	8.0	75.5	9.7	7.5	77.3	9.0	6.2	68.8
	VII	8.6	6.2	72.1	8.0	4.7	58.7	10.0	6.9	69.0	6.9	4.6	66.6
	VI	6.4	3.5	54.7	6.5	3.0	46.1	6.2	3.9	62.9	7.5	4.0	53.3
	V	4.9	2.2	44.9	5.5	2.9	52.7	6.3	3.5	55.5	5.7	2.7	47.3
Multiplication.....	VIII	7.2	6.4	88.8	7.8	5.3	67.9	7.8	6.0	76.9	7.0	4.2	60.0
	VII	6.5	5.2	80.8	5.7	2.9	50.8	8.9	5.1	57.3	5.5	3.2	58.1
	VI	5.4	2.0	37.0	4.4	2.6	59.1	4.9	3.2	65.3	4.9	2.0	40.8
	V	3.5	1.0	28.5	4.0	1.0	25.0	4.7	2.3	48.9	3.6	0.9	25.0
Division....	VIII	7.4	5.0	67.5	7.5	5.2	69.3	8.0	5.5	68.7	6.2	3.5	56.4
	VII	6.6	4.5	68.2	5.0	3.0	60.0	9.0	6.5	72.2	4.5	2.5	55.5
	VI	3.9	1.0	25.6	3.7	0.5	13.5	3.9	2.0	51.2	4.1	1.5	36.5
	V	2.9	0.4	13.7	3.2	0.4	12.5	4.0	1.7	42.5	3.5	0.35	10.0

tests. It will be seen here that the attempts, rights, and percentage of accuracy are all above those of the rural and village schools of Santa Clara County with the single exception of the standard for eighth-grade multiplication.

COMPARISON OF DIFFERENT GROUPS OF SCHOOLS

Table VI shows the differences in results obtained in different groups of schools. Some startling surprises await us when we examine the table. It can be seen that the one-room rural schools, where but one teacher teaches all of the eight grades, obtain better results in accuracy than do the two-room schools, where the eight grades are divided between two teachers; the three-room schools obtain better results in accuracy than do the other three groups; and the village schools fall below the one-, two-, and three-room rural schools. The village schools fall below not only in accuracy, but also in the number of examples attempted, and in the number of examples correctly worked. We naturally ask, What is the reason for this? Or rather, how is it possible? I have in mind particularly one district where the building is a frame shack, built in 1857, nearly three-quarters of a century ago, dilapidated now, and so unsanitary that a person risks his life in entering it. The cattle in the immediate vicinity are housed under more attractive, sanitary, and one is tempted to say, more humane, conditions than are these children during the greater part of their waking hours. The teacher here is her own janitor, and has to teach with practically no apparatus. But I do not wish to leave the impression that all the one-room rural schools in Santa Clara County are like this. I recall with pleasure another district, where the school building and surroundings furnish a home for the children during the day in every sense of the word. It contains a classroom well heated and ventilated, with adjustable seats, all modern apparatus; a library with table and chairs and leaded-glass bookcases; and a combination dining-room and kitchen, furnished with china and cooking-utensils, where a warm lunch is served daily to the children.

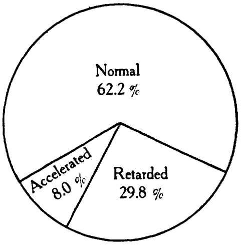


FIG. 2.—Total normal, accelerated, and retarded children.

TABLE VII

AGE DISTRIBUTION OF CHILDREN AND AVERAGE SCORES

AGE	GRADE VIII					GRADE VII					GRADE VI					GRADE V				
	No. in Each	A	S	M	D	No. in Each	A	S	M	D	No. in Each	A	S	M	D	No. in Each	A	S	M	D
18........	1	5	3	4	0	1	7.0	10.0	6.0	6.0	.....	.....	.....	.....	.....	1	4.0	4.0	0.0	0.0
17........	1	3	4	4	3	1	4.0	5.0	1.0	1.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16........	10	4.9	6.5	4.0	3.6	3	3.0	5.7	3.0	2.0	1	7.0	9.0	11.0	1.0	.....	.....	.....	.....	.....
15........	22	5.6	7.6	6.1	5.8	13	4.6	8.5	5.5	6.3	6	3.2	4.0	4.4	2.1	2	0.0	0.0	0.0	0.0
14........	**55**	**5.0**	**7.6**	**5.8**	**5.5**	31	3.7	5.0	3.3	2.8	9	2.7	4.1	2.8	1.2	6	2.4	3.0	2.6	1.2
13........	**39**	**5.6**	**8.0**	**6.3**	**6.2**	**51**	**5.4**	**6.4**	**4.3**	**4.8**	25	2.9	3.5	2.5	1.8	15	1.8	3.6	1.8	1.3
12........	9	5.4	9.1	6.2	6.8	**50**	**4.3**	**6.1**	**2.7**	**4.4**	**41**	**3.1**	**3.8**	**3.1**	**1.9**	26	2.2	3.3	1.9	1.3
11........	.....	.....	.....	.....	.....	10	2.8	6.0	4.8	4.4	**37**	**3.2**	**4.4**	**2.9**	**2.2**	**36**	**2.9**	**3.4**	**2.3**	**1.6**
10........	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	3.0	4.8	3.6	3.3	**54**	**2.7**	**2.1**	**1.8**	**1.1**
9........	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	3.7	4.4	2.5	1.1
8........	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

The two schools described furnish extreme illustrations. The village schools on the whole are better equipped, better graded, and have older and more experienced teachers than have the rural schools.

The time allotment for arithmetic, as laid down in the course of study, is equal for all the schools. But why these differences in results? If I were to suggest that one fundamental reason may be found in the method of selecting teachers, and their tenure in office, it might be thought that I was becoming personal! In the school making the poorest showing, every teacher is a home product, and most of them attend the church with which the members of the school board are affiliated.

PROGRESS OF THE CHILDREN

Table VII shows the age distribution of the children and their average score in arithmetic. From this table Table VIII was compiled, showing, in a rather general way, the number and percentage of normal, accelerated, and retarded pupils in the rural and village school of the county. But since the grades are not divided into upper and lower divisions, and the schools have no half-yearly promotions, the number of normal, accelerated, and retarded children cannot be accurately determined. No doubt the number of retarded and accelerated pupils would be considerably higher if there were more accurate grading and half-yearly promotions.

TABLE VIII

NORMAL, ACCELERATED, AND RETARDED BY GRADES

GRADE	NORMAL		RETARDED		ACCELERATED	
	No.	Per cent	No.	Per cent	No.	Per cent
VIII........	94	68.6	34	24.8	9	6.6
VII.........	101	63.1	49	30.6	10	6.3
VI..........	78	58.1	41	30.7	15	11.2
V...........	90	59.1	50	33.0	12	7.9

Since it is the object of the school to work for the welfare of the individual child, it is of great importance to consider the retarded and accelerated children as well as the normal ones. The recognition and analysis of the differences among children call for greater attention than is usually given. Especially is this true in the rural districts. Children ordinarily enter the first grade at the age of six years, and complete the eighth grade at the age of fourteen years. Those who accomplish this have made normal progress. It is for these that the course of study and the system of grading is best adapted. Those who complete the eight grades in less than eight years, or whose ages are less than those of the pupils whose progress is normal, are said to be accelerated. Those who require more than eight years to finish the eight grades, and who are older than the normal children, are said to be retarded.

The first significant fact in Tables VII and VIII is that the number of accelerated and retarded pupils is considerably greater than is usually supposed; and the second, that the greater the retardation, the lower is the number of problems worked and the lower their percentage of accuracy. And the converse is also true.

The rural and village schools are doing but very little to meet the needs of their exceptional children. The bright ones are held back and acquire habits of carelessness and idleness, while the dull ones are compelled to take the work over and over, and hence offer severe problems of discipline. The writer has in mind one boy who at the age of nineteen years was doing unsatisfactory work in the fifth grade. After being tested with the Binet-Simon scale of intelligence test he was found to have the mental age of eight and a fraction years. In all probability he will never exceed the mentality of the average ten-year-old boy. It is useless to attempt to teach him the subjects found in the old traditional curriculum. This is but one of a fairly large number of hopeless cases of this sort.

Retardation is caused not only by mental deficiency, but a great many other causes might also be mentioned, viz.: poor home conditions, physical ailments (under the latter may be included malnutrition, which is not so much a lack of food, but improper food), poor vision, defective hearing, enlarged tonsils, defective teeth, etc. Difficulty with the English language, lack of application, poor attendance, laziness, late entering, and delinquency are responsible for slow progress also. It is observed that many of these causes are closely related, and after careful analysis and inquiry into the exact conditions, they can all be put under the following classification, viz.: mental deficiency, lack of medical supervision, and poor home conditions. Physical defects and ill health are probably the most potent causes of retardation.

CONCLUSION

The object of this study has not been to pull to pieces, or to tear down and destroy, nor to criticize adversely, but to gather facts. The findings, on the whole, have been contrary to expectations. And a final word as to the use of standard tests seems to be in place. I can do no better than quote Professor Sears in his recommendations to the Salt Lake City schools:

> Teachers should become familiar with such scales and tests as have been used here, not with how they were made, but with how to use them. The teacher who is able to measure her own product, or to have it measured by the supervisor, will develop confidence in her methods or discover reasons for changing them.
>
> As an instrument in supervision, tests are indispensable. Of course tests can never displace constructive helpful criticism, but standardized tests furnish a rational basis for such criticism, without which the best supervision is handicapped. So far as we observed, they are being properly used by the principals and supervisors, but they may even go farther in displacing the ordinary forms of school examinations.[1]

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[1] J. B. Sears, *Report of a Survey of the School System of Salt Lake City Utah*, p. 186.